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ABSTRACT

Experience in the visual arts promotes students' development of perceptual skills. Visual perception relies on identifying, sorting, and organizing images. This study hypothesized that drawings by Native American and Caucasian students would evidence different visual images when drawn from the same visual stimulus. Students in ninth-grade art classes in three schools drew an eagle by copying a still-life and completed questionnaires. The 76 subjects were 63 percent male, were 32 percent Native American, and ranged in age from 12 to 19. Two independent judges rated certain details of the drawings, as well as overall "likeness to eagle." Overall, Native American students tended to score slightly better than White students, although results varied for subsamples and details. Contains references and 15 figures. (SAS)

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CROSS-CULTURAL VISUAL PERCEPTION

NATIVE AMERICAN DRAWINGS

by

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A Terminal Project

Presented to the Department of Art Education

University of Oregon

Eugene, Oregon

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Master of Science

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This paper is a report of an exploratory study comparing drawings of Native American and Caucasian adolescent students.

Purpose of Study

Experience in the visual arts directs students toward development of perceptual skills as they progress through the grades. Perception relies on images: identifying, sorting, and organizing. If these fundamental processes are different for Native American students and if these could be identified in drawings, increased knowledge could contribute to more effective teaching of art and success in school for Native American students.

Hypothesis: Drawings by Native American and Caucasian students will evidence different visual images when drawn from the same visual stimulus.

Review of Relevant Literature

In the search for studies which have included Native Americans as a significant part of the group studied, few have been found which have been related to art. Studies of cognitive style, I.Q., developmental states, and verbal ability have been carried out using written tests rather than drawing or composition. Some exceptions, however, are reported in the literature. Anastasi and Foley (1968) assessed animal

drawings by Indian children of the Pacific Northwest Coast which had been collected during the thirties by Frank Boas. The children were simply directed to draw an animal.

> Both the subject matter and the technique of drawing reflect specific cultural and experiential factors rather than age differences or developmental stages... The fact that in response to the request to draw an animal, some of the children drew mythical creatures is in itself significant and quite unlike results which would be obtained under similar conditions with children in our own culture (p. 374).

In Williams, Teubner, and Harlow, "Creativity in Rural and Urban Indian Children" (1973, p. 113), the picture construction part of the test involved three activities: (a) A colored shape to stick on colored paper to make a picture in mind; (b) Adding lines to incomplete figures; and (c) With pencil or crayons, making objects or pictures from pairs of lines to complete pictures. In this study there was no significant difference noted for figural creativity between rural and urban Indian children. Rural children did score higher on verbal measures.

Standardized tests were used by Gaddes, McKenzie, and Barnsley to compare the visual-spatial abilities of North American Northwest Coast Indian children and Canadian white children. They report that analysis of covariance on four tests which were largely culture-free showed no superiority or inferiority of spatial imagery of the Indian children. The study included 68 white and 56 Indian children. "Sociological theories suggest that a genuinely culture-free intelligence test might have revealed a slight spatial superiority on the part of the Indian children" (Gaddes, McKenzie, & Barnsley, 1968, p. 41).

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Laurel L. Bland (1970) studied "Perception and Visual Memory of School Age Athabascan Indians in Alaskan Villages." The hypothesis supported was that

> Alaskan natives (Eskimos, Aleuts, and Indians) possess greater ability than the dominant Caucasian culture to perform tasks associated with perception and visual memory, and this greater skill can be measured and interpreted for application to enhance formal learning of students" (p. 9).

Schools and Populations

There are a number of independent variables which may particularly impinge on Native American students' drawings: (a) Their previous drawing experience; (b) whether their teacher is of Native American or Anglo heritage; (c) Their current living situation with biological family, substitute family (either foster or adoptive), or boarding school; and (d) The nature of the school setting--urban, rural, BIA boarding, public with Caucasian dominance, public with 30 percent Native American student population, contract school with Indian administration, or school on a reservation. Each of these factors may affect the kind of experience a student has and in some way affect his/her perceptual learning. The current living situation is known only for those students in School 2, a BIA boarding high school.

Schools

Three schools were selected for this study. The first was a rural high school with 30 percent Native American student population,

near a reservation. The second was a BIA boarding school with 100 percent Native American student population. The third was an urban, public junior high school with incidental Indian student population.

Students

The target population was ninth-grade students, both Native American and Caucasian, in an art class. In this study 63 percent of the students in the art classes in the three schools were male. The age range was from 12 to nineteen years old: one-fourth were 15 years old, one-fifth were 14, and one-seventh were 13 and 16 years old (Figure 1). Five boys in School 2 did not indicate their ages; however, their drawings are included in the results of the study. One girl in School 1 became ill suddenly and was unable to participate. The average age of all the Indian students in all the schools was one year older than the average age of all the white students (Figure 2).

Classes

School 1 included ninth graders in the high school. Two classes participated in the study--Art I with 18 students, and Advanced Art with 14. School 2, a privately controlled BIA facility opened in January, 1980, also included ninth graders in the high school. One Design class, consisting of 17 students, participated in the study. Four students started drawing late, and stayed after class to complete

Ethnic Origin	Total	Sex				Age (yrs)								
		M		F										
		No.	(%)	No.	(%)	12	13	14	15	16	17	18	19	(?)
Caucasian	41	28	37	13	17	2	8	10	11	7	2	-	1	-
Native American	32	19	25	13	17	-	2	5	8	4	6	2	-	5
Asian American	1	1	1	-	-	-	-	1	-	-	-	-	-	-
Mexican American	2	-	-	2	3	-	1	-	-	-	1	-	-	-
Total	76	48	63	28	37	2	11	16	19	11	9	2	1	5
				Percent		2.6	14	21	25	14	12	2.6	1.3	6.5

Figure 1. Ethnic Origin, Age, and Sex of Students in All Three Schools

	Years	Months
Caucasian Male	14	7
Native American Male	15	7
Caucasian Female	14	5
Native American Female	15	5

Figure 2. Average Age of All Native American and Caucasian Students in All Three Schools

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their drawings in the prescribed forty minutes. One boy got disgusted with his work, folded and wadded his drawing paper, and left the room. The third school placed ninth graders in junior high. The school was public, one of nine junior high schools in the district. One Drawing class of 30 students participated in the study.

Teachers

The teachers in the three schools were all male: Caucasian, Native American, and Mexican-American. The art teacher in School 1 grew up in a nearby town and had taught in the rural high school for 12 years. The art teacher in School 2, in accordance with BIA policy, was Indian, and in his second year of teaching in the school. In School 3, the art teacher was nearing the end of his first year of teaching. The researcher was white female, visiting Schools 1 and 2 for the first and only time the day the drawings were collected. This was her second visit to School 3, having previously consulted briefly with the art teacher during his lunch hour.

Setting

In all three schools the tables were arranged in a circle with the still-life in the middle. Students were about eight to ten feet from the eagle, except in the third school, where smaller tables had to be utilized because of the large size of the class. Consequently, in School 3 eight students were in a second row, which was a disadvantage because it placed the students farther from the eagle and

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necessitated their looking between and around others in the class.

Placing the eagle centrally gave everyone (except as noted above), a clear, but also a different view. The total set of drawings included front, back, and side view of the eagle. The students were cooperative, but not all were content with their views. In School 1 a girl crowded her drawing paper on the corner of the table in order to draw the eagle's head from the side and then moved to another location. Four boys overlapped their drawing papers at the same table in order to avoid having a back view and to remain together with friends. In School 2 a girl pondered her position standing by the window and then set up an independent drawing station in order to have her preferred view. A second girl followed suit. In the third school, before the students started to draw the art teacher made a game of turning the eagle around saying, "Where it stops nobody knows," in order to settle the question of which student had which view.

Testing Procedures

Questionnaire

The students were given a questionnaire to fill out concerning ethnic origin, age, sex, year in school and previous drawing experience. The students took about five minutes to fill out the questionnaire and to record the number of the questionnaire on the back of their drawing paper. The questionnaire was read aloud to the students. They were given 18 x 24-inch drawing paper, soft drawing pencils, and pink pearl and art gum erasers.

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The questionnaire was as follows:

CIRCLE YOUR ANSWERS:

1. Number of your drawing: _____
2. Age: 12 13 14 15 16 17 18 years.
   1 2 3 4 5 6 7 8 9 10 11 12 months.
3. Ethnic Origin:
   American Indian or Alaskan Native, tribe:_____
   Asian American
   White
   Mexican American
   Black
   Other. Describe:_____.
4. Sex: Male Female
5. Number of years in this school 1 2 3 4 .
   Number of months 1 2 3 4 5 6 7 8 9
6. Previous drawing experience (circle all answers which seem appropriate)
   Last year
   Elementary School
   Last term
   Draw on my own
   Junior high school
7. Number of weeks in this art class: 1 2 3 4 5 6 7 8 9 10 11
8. Number of months in this art class: 1 2 3 4 5 6 7 8 9
9. This class is: Elective Required
10. Comments or questions.

Immediately after filling out their questionnaires, the students were presented with the drawing task. After they had their drawing materials, and before they started to draw, the following statement was read to them:

I want you to draw a picture. This Golden Eagle is about 40 years old, on loan from the University of Oregon Museum of Natural History. The eagle is your point of departure. I am interested in your interpretation of an eagle. In your drawing, if you want, you can elaborate on what you see: the eagle could be sitting on a branch, it could be soaring, or it could be in a setting with other things. You have drawing paper, pencils and erasers, and forty (40) minutes to draw. Please draw for the entire time and do your very best drawing.

Analysis Procedure

A total of 75 drawings were collected from students in the three schools.

Two independent raters went through the drawings. Each rater sat at a table with a stack of 75 drawings and rating sheets and individually rated each drawing, one rating sheet per drawing. The following directions were given to the raters:

DIRECTIONS TO RATERS OF DRAWINGS:

1. I will show you 11 slides of the still life, a Golden Eagle. The slides include overall views of front, back and side, plus details of head, claws, and tail.
2. Color is not a factor in this study.
3. There is a total of 75 drawings.
4. There is a number on the back of each drawing. Please put the number of the drawing on each rating sheet.
5. TO RATE THE DETAILS, circle the number on the scale which best describes what you see in the drawing in relation to what you see in the slides of the eagle.

   TO RATE THE DRAWING, circle the number on the scale which in your opinion best describes the quality of the drawing of the eagle.
6. Please complete one rating sheet for each drawing.
7. You may refer back to the slides as you go along.

Each rater filled out a rating sheet for each of the 75 drawings. The following rating sheet was used:

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RATE THE DETAILS OF THE DRAWING:

Drawing No._____

Claws	1 2 3 4 5	(Consider shape/form, shading, and proportion. Circle your answers.)
Eye	1 2 3 4 5	
Beak	1 2 3 4 5	1 - No evidence
Wing	1 2 3 4 5	2 - Poor
Tail	1 2 3 4 5	3 - Fair
		4 - Good
		5 - Excellent

RATE THE DRAWING:

Composition/placement on paper	1 2 3 4 5
Perspective/depth/space	1 2 3 4 5
Looks like an eagle	1 2 3 4 5

The rating scale devised for looking at the drawings was intentionally short due to the large number of drawings collected. The numbers one through five were commonly understood and easy to use in rating and tallying the results. The raters were asked to consider shape/form, shading, and proportion while rating the drawing details. When rating the overall drawing the raters were to consider composition in reference to unity and balance of image in relation to size and placement on the paper, perspective in reference to three-dimensional quality or distance inward or backward from the foreground, and looks like an eagle in relation to proportion of parts of body to each other and likeness of image drawn to actual eagle.

The actual time spent in drawing varied among the classes in the three schools (Figure 3). In School 1, Art I, the students drew for 37 minutes. In Advanced Art the students drew for 39 minutes. In School 2 the drawing time was 38 minutes, and in School 3 the drawing time was only 32 minutes. Three factors contributed to the shorter drawing time in School 3: Large size of class, shorter class period (only 42 minutes), and paste on tables from previous class period.

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School No.	Class	Time (min.)
1	Art I	37
2	Advanced Art	39
3	Drawing	32

Figure 3. Actual Drawing Time

The variety possible in a set of drawings by adolescent students looking at the same eagle is considerable (Figure 4). Fourteen placed the paper horizontally, 15 were unfinished or incomplete, 10 had more than one drawing or detail on front or back, 12 placed the eagle in an indoor or outdoor setting, 17 indicated shading or value by rubbing with the finger, 71 used the side of the pencil lead, 43 used heavy shiny graphite for texture or detail. Of the total set of drawings collected, there were 14 front views, 48 side views, and 13 back views. In addition, 37 seemed to have the parts of the eagle in proportion to each other. These observations are excluded from the results.

Horizontal Paper	Unfinished Incomplete	More than One Image	Eagle in Setting	Shading Rubbing	Pencil Side	Graphite Heavy
14	15	10	12	17	71	43

View of Eagle			Body Parts in Proportion
Front	Side	Back	
14	48	13	37

Figure 4. Variety in Drawings

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In this study no attempt was made to make comparisons on the basis of tribal affiliation, but there were 18 tribes represented by the students in the three schools (Figure 5).

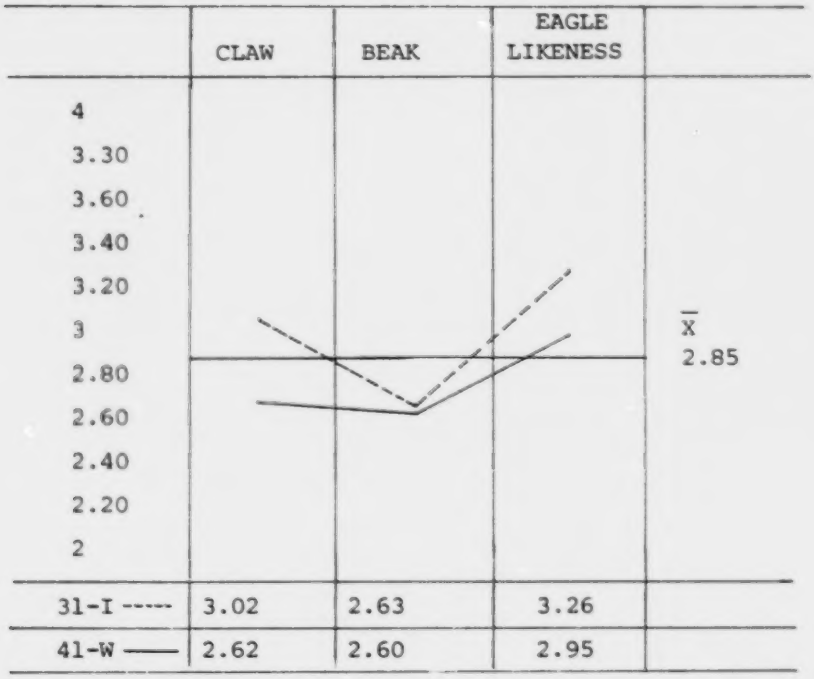
All the drawings collected were used in this exploratory study of drawings by Caucasian and Native American students collected under similar circumstances in familiar school settings.

There are three categories in which there was 80 percent rater agreement of all Native American and all Caucasian students in all three schools (Figure 6). Only the high school students in Schools 1 and 2 in the same three categories--claw, beak, and eagle likeness--are shown in Figure 7. The average age of these students is shown in Figure 8. Drawings excluded are those done by those of other ethnic origins (refer to Figure 1).

The sideview drawings were selected at the high school level, School 1 and 2, based on two factors: All the details rated could be seen in side view drawings and there were six categories in which there was 80 percent rater agreement--claw, eye, beak, wing, tail, and eagle likeness (Figures 9, 10, 11). Using this viewpoint, the number of drawings decreased to 28, 8 by Caucasian males, 4 by Caucasian females, 8 each by Native American males and Native American females.

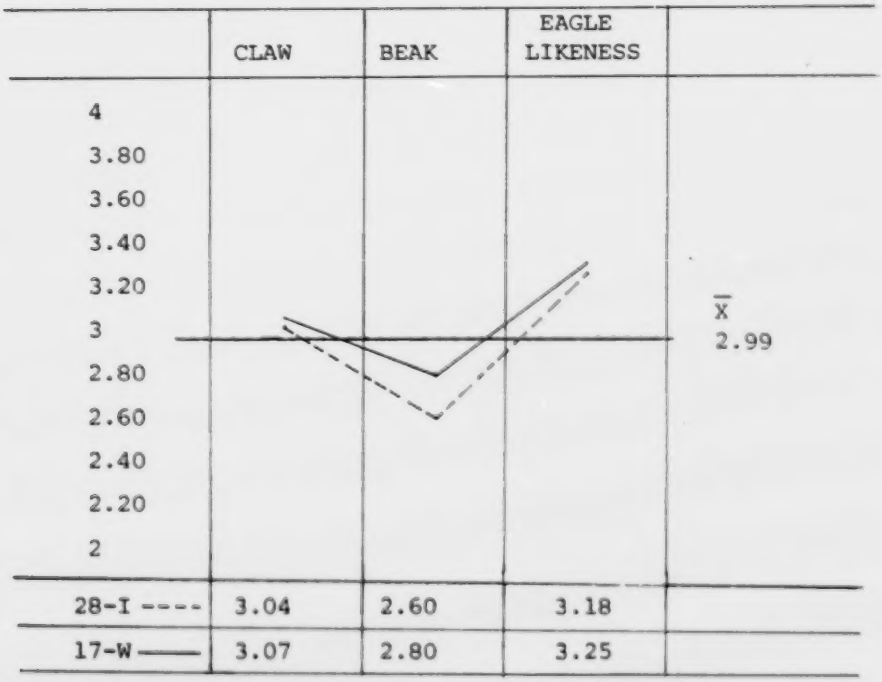
Warm Springs/Umatilla	Klamath/Modoc	Couer d'Alene	Yakima Nation
Warm Springs/Yakima	Blackfoot 3	Nisqually	Hupa/Yurok
Sioux/Flathead	Sioux	Wasco/Paiute	Navajo
Shoshone/Bannock 2	Chippewa 2	Klamath	Navajo
Cherokee	Warm Springs 3		

Figure 5. Tribes of Native Americans Represented (24 of the 32 participants indicated their tribal origin)



31-I -----	3.02	2.63	3.26
41-W ——	2.62	2.60	2.95

Figure 6. All drawings from All Schools by Native American and Caucasian Adolescent Students in Three Categories



28-I ----	3.04	2.60	3.18
17-W ——	3.07	2.80	3.25

Figure 7. High School Drawings from Schools 1 and 2 by Native American and Caucasian Adolescent Students in Three Categories.

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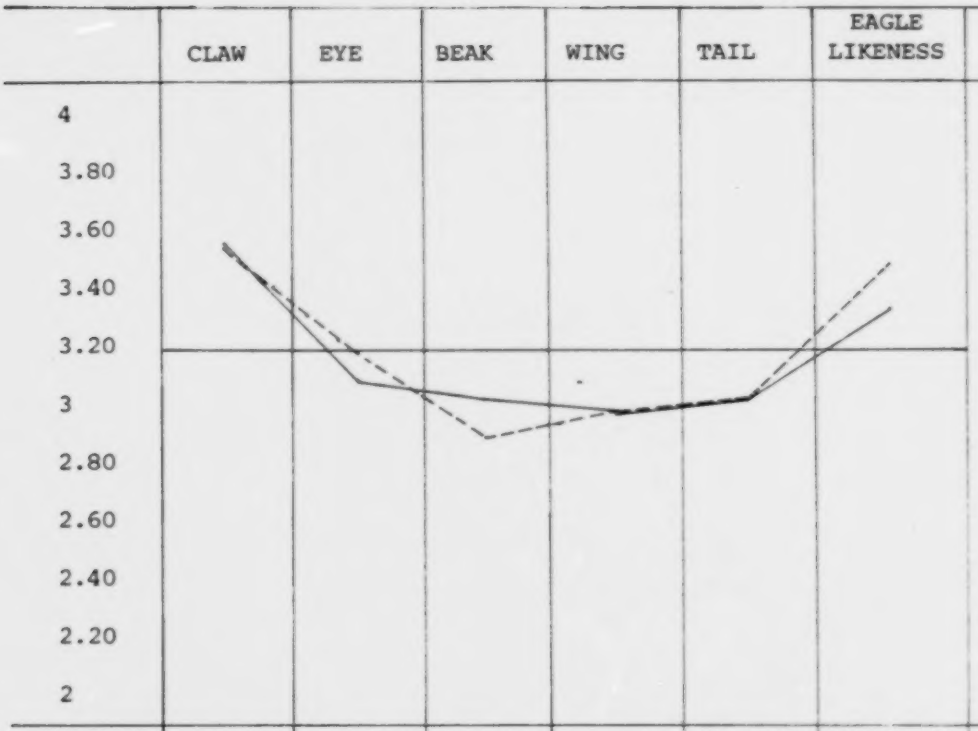
	No.	Average Age	12	13	14	15	16	17	18	19	(?)
Rural High School 1											
Caucasian Male	12	15.75	-	-	1	4	6	-	-	1	-
Native American Male	7	15.43	-	-	3	1	1	1	1	-	-
Caucasian Female	5	16.00	-	-	-	2	1	2	-	-	-
Native American Female	5	15.60	-	-	1	2	-	2	-	-	-
BIA Boarding High School 2											
Native American Male	10	16.00	-	-	-	2	1	2	-	-	5
Native American Female	6	16.17	-	-	-	2	2	1	1	-	-
Urban Jr. High School 3											
Caucasian Male	16	13.50	2	6	6	2	-	-	-	-	-
Native American Male	2	13.50	-	1	1	-	-	-	-	-	-
Caucasian Female	8	14.13	-	2	3	3	-	-	-	-	-
Native American Female	1	15.00	-	-	-	1	-	-	-	-	-

Figure 8. Ethnic Origin, Age and Sex of Students in Individual Schools



	CLAW	EYE	BEAK	WING	TAIL	EAGLE LIKENESS	
N: 8-I----	3.56	3.19	2.88	3	3.06	3.5	
N: 8-W——	3.57	3.09	3.06	3	3.06	3.34	

Figure 9. Sideview Drawings from Schools 1 and 2 by Native American and Caucasian Males in Six Categories

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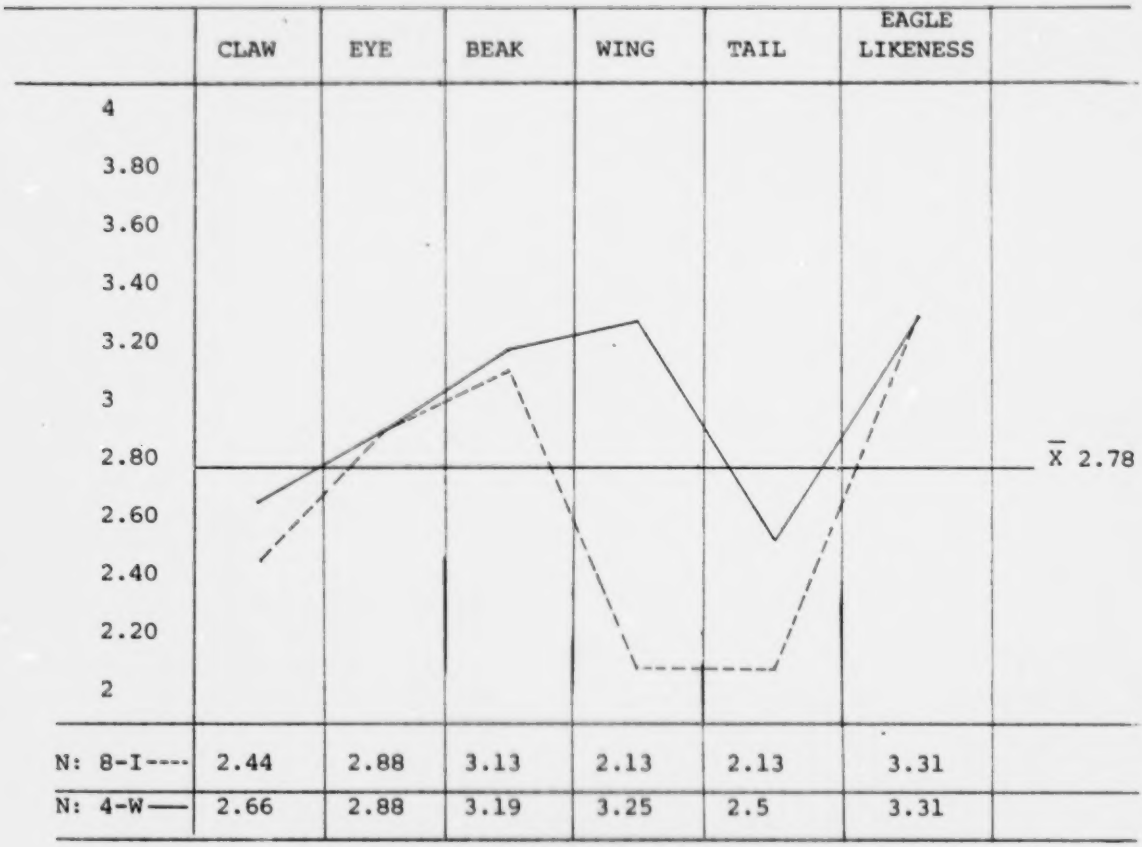

	CLAW	EYE	BEAK	WING	TAIL	EAGLE LIKENESS
N: 8-I----	2.44	2.88	3.13	2.13	2.13	3.31
N: 4-W——	2.66	2.88	3.19	3.25	2.5	3.31

Figure 10. Sideview Drawings from Schools 1 and 2 by Native American and Caucasian Females in Six Categories

	CLAW	EYE	BEAK	WING	TAIL	EAGLE LIKENESS
N: 16-I	3	3.04	3.01	2.57	2.60	3.41
N: 12-W	3.12	2.99	3.13	3.13	2.79	3.33
$\bar{X}$ $\bar{X}$	3.06	3.01	3.07	2.89	2.69	3.37

Figure 11. Sideview Drawings from Schools 1 and 2 by Males and Females of the Same Ethnic Origin

Figure 11 combines the sideview drawings of males and females of the same ethnic origins, Indian and white, in six categories. Figures 8 and 14 show that in this case the white males were slightly older than the Indian males; Figures 8 and 14 indicate that white females were older than Indian females (high school, side view drawings). Therefore, age alone is not the governing factor in differences in perception of the overall image recorded in drawing.

All side view drawings of all female students in all three schools are shown in Figure 13. There were five additional side view drawings by white females in School 3, a junior high, but none by Indian females. The junior high age breakdown of side view drawings is shown in Figure 15.

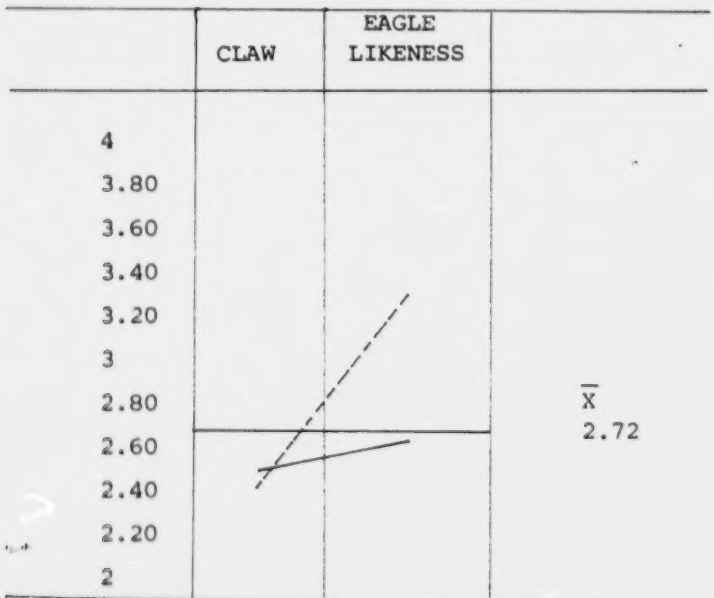

Figure 12. All Sideview Drawings of All Female Students in All Three Schools in Two Categories.

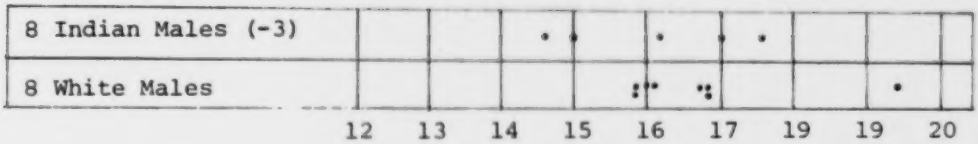

Figure 13. Ages of Students Who did Side View Drawings, Schools 1 and 2

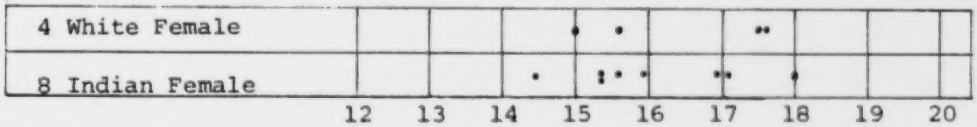

Figure 14. Ages of Female Students Who Did Side View Drawings, Schools 1 and 2

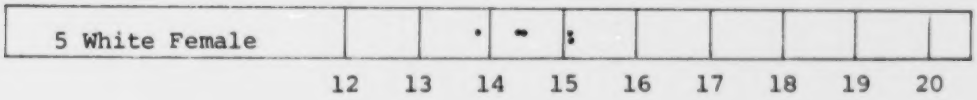

Figure 15. Ages of Female Caucasian Students Who Did Side View Drawings in School 3, a Junior High

Results

When the entire set of drawings was considered, Indian students tended to score above white students in claw, beak, and likeness to eagle. The average age of all Native American students was about one year older than Anglo students.

When students of only Schools 1 and 2 were considered, the picture reversed and white students scored above Indian students in claw, beak, and eagle likeness. In this smaller sample, the Anglo males were slightly older than the Native American males, and the Native American females were older than the Anglo females.

When only side view drawings were sorted out from the entire set at the high school level, figures show that the Indian males scored above white males in eye and likeness to eagle; they scored the same as white males in wing and claw details, and virtually the same in claw detail. White males scored above Indian males in beak detail.

Figures show that Indian females scored equal to white females in eye and likeness to eagle, and below white females in claw, beak, and wing and tail. The white females scored above Indian females in claw, beak, wing, and tail details, but the same in eye and likeness to eagle.

Figures show that in comparing average results of Indian and white students' side view drawings at the high school level, Native American students did better in eye detail and likeness to eagle. And the Anglo students' side view drawings at high school level were better in claw, beak, wing and tail detail.

Because the number of Anglo side view drawings at high school level was only four, and there were no Native American female students

with side view drawings, the results of all the side view drawings of all female students in all three schools were considered. The number is small--only eight Indian students and nine white students--and there were only two categories in which there was 80 percent rater agreement. The Native American females scored far above the Anglo students in likeness to eagle, and below Anglo females in claw detail.

In this subgroup of side view drawings of all female students, the Indian females were one-half year older than the white females. Age alone is not the governing factor in the difference in perception, because of the diversity represented by the three schools attended and by the average age of all students in the study. White students were a full year younger, and there was only one Indian female in the urban junior high.

Conclusions

These results must be used with caution as this was an exploratory study and the number is small; but there is some evidence of a pattern of perception of overall image. "Likeness to eagle" became the primary consideration, based on several factors: Rater agreement in judging the drawings was 80 percent in agreement; composition and perspective were totally eliminated because of lack of agreement; subgroup comparisons other than those shown were eliminated on the same basis. However, the overall results held in overall perception of the image, reflected in the one category, "likeness to eagle." The impact

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of each individual drawing is reflected in the raters' scores, and the impact of the image before each individual student is reflected in his/her drawing. In this test the Native American students did better in perceiving the overall image and recording their perception in drawing.

Implications for Education

Gross generalization in reference to superiority of one group over another are inappropriate and inadvisable. However, there is evidence to support the position that Native American students can have success in school. When taken as a group, Native American students did better in this study than white students in perceiving the overall image. This study had nothing directly to do with verbal skills or written information. The study was done in Oregon, so perhaps a general conclusion could be drawn in reference to Native American students in the Northwest--certainly in reference to art and art education. Native American students can be expected to do as well as or better than students of the dominant white society in public school art classes.

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